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ABSTRACT

This study explores the influence of neighborhood conditions on child maltreatment. Unlike previous studies conducted with protective services data aggregated to neighborhoods, this study uses a self-report measure of child abuse potential and controls for individual risk factors in a multilevel model. The survey was completed by an adult residing in each of 400 households in Cleveland (Ohio), with the sample almost equally divided between African American and European American respondents. Neighborhood impoverishment and child-care burden significantly affect child abuse potential after controlling for individual risk factors, but the neighborhood effects are much weaker than they appear to be in aggregate studies based on official child maltreatment reports. It is suggested that neighborhood characteristics may affect the child maltreatment reporting process as well as present a context in which child maltreatment potential manifests itself as an actionable event. (Contains 6 tables and 74 references) (Author/SLD)

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NEIGHBORHOODS AND CHILD MALTREATMENT: A MULTI-LEVEL STUDY

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Abstract

This study explores the influence of neighborhood conditions on child maltreatment. Unlike previous studies conducted with protective services data aggregated to neighborhoods, this study uses a self-report measure of child abuse potential and controls for individual risk factors in a multi-level model. Neighborhood impoverishment and child care burden significantly affect child abuse potential after controlling for individual risk factors, but the neighborhood effects are much weaker than they appear to be in aggregate studies based on official child maltreatment reports. It is suggested that neighborhood characteristics may affect the child maltreatment reporting process as well as presenting a context in which child maltreatment potential manifests itself as an actionable event.

NEIGHBORHOODS AND CHILD MALTREATMENT: A MULTI-LEVEL STUDY

The ecological perspective on child maltreatment argues that multiple levels of social organization must be taken into account in order to achieve a full understanding (Cicchetti & Lynch, 1993; Belsky, 1980; Garbarino, 1977, Zuravin, 1989). One important ecological unit is the neighborhood in which families and children reside. Neighborhoods are geographically bounded groupings of population and institutions socially connected through structures and processes. The ecological perspective suggests that the neighborhood context in which they live may raise or lower the risk that children will be maltreated and will be officially reported as such.

The notion that neighborhoods may affect child maltreatment is supported by several studies that have documented the clear variation among neighborhoods in their reported rates of child maltreatment. Neighborhood maltreatment rates have been found to be correlated with a number of measures of neighborhood demographic composition, economic disadvantage and residential mobility (Coulton, Korbin, Su, & Chow, 1995; Deccio, Horner & Wilson, 1994; Drake & Pandy, 1996; Garbarino & Crouter, 1978; Garbarino & Kostelny, 1992; Garbarino & Sherman, 1980; Vinson, Baldry & Hargreaves, 1996; Zuravin, 1989). Further, child maltreatment rates in neighborhoods have been shown to correlate with other indicators of social distress such as infant mortality, juvenile delinquency, violent crime and drug trafficking (Coulton, et al., 1995).

However, studies linking structural characteristics of neighborhoods with aggregate rates of child maltreatment are inconclusive in many ways. First, they all use official maltreatment reports that are subject to reporting biases. Aggregate level correlations could be the result of higher reporting rates in neighborhoods with certain

demographic and economic profiles rather than true neighborhood effects. Second, aggregate data does not permit the personal characteristics of neighborhood residents to be taken into account when testing neighborhood effects. If residents of poor and unstable neighborhoods have more personal risk factors for maltreatment these individual level effects could show up in aggregate correlation and appear to be neighborhood influences. Finally, aggregate studies measure only demographic and economic characteristics of neighborhoods. They are unable to identify the community processes through which neighborhood social structure influences the ways families treat their children.

In order to overcome these limitations, we designed a study of neighborhood effects on child maltreatment that did not rely solely on reported rates but used surveys of a representative sample of families with children nested within neighborhoods. The survey was able to measure known familial risk factors and used a measure of child abuse potential as a way of avoiding response and reporting biases. Additionally, residents' perceptions of the levels of resources and controls in their neighborhoods were measured as a means of understanding the processes through which neighborhood structure might affect child maltreatment. The major premise of the study was that structural conditions of neighborhoods influence community resources and social controls. It was anticipated that both structures and processes internal to the neighborhood would affect child maltreatment as measured by both official maltreatment reports and child maltreatment potential.

Background

The need for a better understanding of neighborhoods and child maltreatment is part of the overall move toward an ecological understanding of child maltreatment. An

ecological model of human development, as conceptualized by Bronfenbrenner (1979), has stimulated theoretical models to explain the complex etiology of child abuse and neglect (e.g., Belsky, 1980; Cicchetti & Lynch, 1993; Garbarino, 1977; Zuravin, 1989), and was the orienting framework for the National Research Council's report on child maltreatment (1993). In these models, child maltreatment is viewed as resulting from a complex interaction of factors and from transactions of these contributing factors across multiple ecological levels that encompass individuals, families, communities, and the larger society and culture. An ecological approach must address problems at multiple ecological levels and understand the connections across those levels. Complex ecological models are theoretically appealing in addressing the complexity of problems such as child maltreatment. However, such models have rarely been subjected to empirical test. In this study, we attempt to address this gap in the research by testing factors that contribute to child maltreatment at the individual and the community levels.

The Limits of Aggregation

Virtually all of the existing research on neighborhood characteristics and child maltreatment has been conducted at the aggregate level and has used reported incidents from child protective agencies. Studies conducted across a variety of regions and metropolitan areas have found similar physical, social and economic factors to be important predictors of child maltreatment rates. Garbarino and Sherman (1980) linked official reports of maltreatment to socio-economic status measures of neighborhoods. In a replication, Deccio et al. (1994) also found the economic status of neighborhoods to be strongly predictive of maltreatment rates. Zuravin (1989) found that official child maltreatment rates were most highly correlated with poverty and vacant housing. Drake

and Pandey (1996) separated neglect rates from abuse rates and found the former to be much more highly correlated with neighborhood poverty rates. The authors have also conducted research on neighborhoods and child maltreatment at the aggregate level (Coulton, et al., 1995) in which factor scores representing neighborhood impoverishment, child care burden, instability and isolation were found to have significant effects.

These types of aggregate level studies tend to fall into the tradition of ecological analysis which seeks to uncover some characteristics of the aggregate that are relevant to the outcome of interest, in this case maltreatment. Although the studies have differed in the explicit mechanisms they posed for neighborhood effects, all implied that something about the neighborhood social structure contributes to the incidence of maltreatment. Nevertheless, a limitation of these studies is that many of the aggregate relationships could alternatively be interpreted as individual level influences that show statistical correlation's at the neighborhood level due to selection. For example, most of the above studies have shown that various indicators of the economic status of the population are highly correlated with child maltreatment rates. It is generally thought that this property of neighborhoods is responsible for some social processes that in turn influence the occurrence of abuse and neglect. However, it is possible that high rates of maltreatment in low income neighborhoods may simply reflect a process at the individual level (Smith & Jarjoura, 1989). For example, the stress of being poor results in poor parents having a higher propensity to neglect and abuse their children. But since poor families also have a tendency to live in low income neighborhoods (i.e. selection) this individual process also manifests itself as an aggregate correlation. It is likely, therefore, that variation in child maltreatment rates by neighborhood reflects both attributes of the individual families who

live there and characteristics of the neighborhoods in which they live. However, aggregate level studies cannot separate these two paths of influence.

Any effort to take both individual and neighborhood effects into consideration is complicated by the fact that many concepts can be both an individual and an aggregate phenomenon. For example, poverty in an individual family may produce lack of personal resources and emotional distress while concentrations of poverty within a neighborhood may result in poor services and negative physical and interpersonal environments . Since personal and neighborhood poverty are correlated, these will be hard to disentangle. Thus, while contextual explanations are often defined as the association between neighborhood characteristics and an individual outcome net of the effect of personal characteristics, this may be too conservative a stance when there is considerable confounding between the two levels of influence .

Although the emphasis in this discussion so far has been on avoiding attributing to neighborhoods anything that can be explained by individual characteristics, there is also cause for concern in the opposite direction. A particular example is the use of race as a variable in most individual level explanations of child maltreatment (Bentancourt & Lopez, 1993; Yee, Fairchild, Weizman & Wyatt, 1993). Numerous studies have shown that African-Americans, especially those with low incomes, are much more constrained in their residential choice than whites (Massy & Denton, 1993). The result of this segregation combined with lower economic status is that poor African-Americans are more than four times more likely to live in concentrated poverty and distressed neighborhoods than their white counterparts (Jargowsky, 1997). Under these circumstances, race represented as an individual attribute is likely to carry with it considerable environmental deprivation as well.

Thus, despite the methodological challenges it is vitally important to take neighborhood context into account rather than reducing all explanations to the individual level.

Bias in Official Reports

Another limitation of existing research on neighborhoods and child maltreatment is that virtually all studies have relied on official reports to the child protection agency. Unfortunately, official reports are known to be subject to multiple sources of bias (Newberger, Reed, Daniel, Hyde, & Kotelchuck, 1977; O'Toole, Turbett, & Nalepka, 1983; Zellman, 1992) some of which, also, may be associated with neighborhood conditions. Depending upon the direction of the reporting bias, this could either inflate or deflate the findings regarding neighborhood effects on maltreatment. A reporting pattern that would tend to inflate the correlation of neighborhood poverty and racial makeup with official rates of maltreatment was found in Hampton and Newberger's (1985) reanalysis of the National Incidence Study (National Center for Child Abuse and Neglect,1981). Race and class of the family were the best predictors of whether an incident was reported to the local authorities by hospitals. Impoverished black families were more likely to be reported than affluent white families, even if the severity of the incident was comparable. Another study found that drownings were more likely to be reported to Child Protective Services if, among other variables, the family was nonwhite and poor (Feldman et al., 1993).

An additional source of potential bias that could deflate aggregate correlations would occur if poor and ethnic minority families, who observed child maltreatment were hesitant to involve child protective services (Green, 1982; Hong & Hong, 1991; Long, 1986). However, in vignette studies, minority respondents have not been found to define child maltreatment less seriously than do whites (e.g. Giovannoni & Becerra, 1979).

Similarly, Korbin & Coulton (1996) found that residents of poor and middle class neighborhoods did not differ in their definitions of maltreatment or in their attitudes towards reporting.

If the chances of a maltreatment report being substantiated by the child protective agency were influenced by family demographics or neighborhood location, this could also bias aggregate correlations. Although research evidence suggests that these factors are influential, studies indicate that the bias could be in either direction. One study found that child protection workers in socio-economically disadvantaged areas with more severe abuse and neglect caseloads had a higher threshold for substantiation while those in socio-economically advantaged areas had a lower threshold in judging the severity of abuse vignettes (Wolock, 1982). However, a study using a different methodology found actual substantiation rates for neglect reports to be two to three times as high in poor as compared to middle class neighborhoods (Drake & Pandey, 1996).

The fact that patterns of over or under reporting may differ depending upon the race or socio-economic status of the family or neighborhood suggests further ambiguities in the findings of the aggregate studies that rely only on official maltreatment reports. Some portion of the demonstrated correlation with neighborhood characteristics is probably due to the tendency of professionals to suspect abuse or neglect more often in such neighborhoods or among poor and minority families. An alternative measure of maltreatment, not subject to these reporting biases, must be used to confirm the findings of neighborhood effects.

Mediating Processes

Many researchers who have conducted aggregate level studies have also been interested in the social processes that may be responsible for the correlation between neighborhood housing, demographics and economic status and child maltreatment rates. These processes typically have been explored by comparing several high and low risk neighborhoods to test out theoretical propositions about what might account for the differences. Garbarino and Sherman (1980) interviewed parents in neighborhoods with varying maltreatment rates and found that they reported fewer social resources in high rate neighborhoods is compared to neighborhoods with low rates of child maltreatment. Garbarino and Kostelny (1992) interviewed community leaders and social service agency clients in a high risk community and a low risk community of similar economic status. They concluded that the low risk community had a stronger social fabric than the high risk community. Vinson and colleagues (1996), in a study of two adjacent economically depressed neighborhoods in Australia, found that the neighborhood with a higher child maltreatment rate had weaker social networks than did the neighborhood with a lower child maltreatment rate. Deccio, Horner, and Wilson (1994), however, using a standardized measure of neighborhood social supports administered to samples of residents, did not find significant differences in social supports between a high maltreatment and low maltreatment neighborhood of similar economic status.

The authors (Korbin & Coulton, 1997), used the results of ethnographic studies in thirteen high and low maltreatment neighborhoods to understand how the census based measures of impoverishment, child care burden and instability were related to maltreatment rates. They concluded that lack of social control and resources were key

features of the neighborhoods that were high on these factors and on maltreatment rates. These ethnographic findings suggest the relevance of two related lines of thinking about the social processes within neighborhoods that might account for the link between structural conditions and child maltreatment.

The first is the concept of community social organization which has a long tradition in community studies of crime and disorder and has recently been understood as a general framework for studying neighborhood effects on families and children (Sampson, 1992; Sampson & Morenoff, 1997). The social organization perspective suggests that low economic status, residential turnover and ethnic heterogeneity may lower the ability of the community to exert its own internal controls setting off a spiral of disorder and decline (Bursik & Grasmich, 1993; Sampson and Groves, 1989; Sampson, 1991). Poor, highly mobile communities are characterized by a sense of distrust and lack the expectation that they can accomplish their aims collectively. There is evidence that such internal processes can lead to violence and victimization even after the economic and demographic characteristics of residents are taken into account (Sampson, Raudenbush & Earls, 1997).

A second perspective has to do with community resources that support parenting and child development. These resources range from the quality and availabilty of services to the nature of interpersonal relationships and help within the neighborhood. Although effective families may reach way beyond the neighborhood to obtain these resources for themselves and their children (Burton, Obeidallah & Allison, 1996; Jarrett, 1995), of interest here is whether neighborhoods with more resources present better opportunities for children and families that might reduce child maltreatment. Supporting this perspective is the finding by Furstenberg (1995) that families' perceptions of their school and

neighborhood quality affected youth outcomes. Further, in his ethnographic work, Furstenberg found that parenting was affected by neighborhood differences in the organizations in which parents participated and in the sources of informal help that were available to them (Furstenberg, 1993).

The multilevel study described here draws on both of these traditions as well as our own ethnographic studies to conceptualize processes within the neighborhood that might be the mechanism through which structural conditions affect child maltreatment. Measures of community social control and resources are conceptualized as possible mediators of social structure on families and children.

Methodology

This study was carried out within neighborhoods of the City of Cleveland. The focus on one locale allowed for dense sampling within neighborhoods, a necessary condition for studying the relationships among neighborhood structure, process and individual risk factors for child maltreatment. However, while this approach has the advantage of obtaining reliable measures of both individual and neighborhood characteristics from survey responses, it does limit generalizability. Metropolitan area differences on the geographic distributions of population demographics and the range of neighborhood conditions can affect the variance-covariance structure of variables and the results of statistical analyses. Methodologists agree that, while such local studies are needed they must be interpreted cautiously until replicated across a range of settings (Cook, Shagle & Degirmencioglu, 1997; Furstenberg & Hughes, 1997).

Cleveland resembles other northern industrial cities in its relatively high level of poverty and racial and economic segregation (Coulton, Chow, Wang & Su, 1996). Its

overall child maltreatment rate (36.3 per 1000 children) during the time of this study was nearly twice the national average (NCCAN, 1988, 1994). However, there was considerable variation among the neighborhoods within the City on economic conditions, demographic characteristics and the incidence of maltreatment. This range was not as great, though, as would be found in newer cities of the South and West in which there is considerably more ethnic and economic diversity and less segregation by race and class (Coulton, et al, 1996).

The study used a multi-level design in which survey respondents were nested within geographically defined neighborhoods. Variables were measured on both the individual respondents and the neighborhoods in which they lived. The hypothesis was that neighborhood structural characteristics would affect neighborhood resources and controls and that both of these neighborhood level conditions would be related to child maltreatment after taking individual risk factors into account.

Sampling

A two-stage sampling strategy was employed with neighborhood units selected first and respondents then selected from within those neighborhoods. In order to assure an adequate range on the structural characteristics that our previous research (Coulton, et al., 1995) had shown to be highly correlated with child maltreatment rates, a stratified sample of neighborhoods was drawn. All residential census tracts in the City of Cleveland (N=196) were stratified on three factors measured with census variables: impoverishment, child care burden and whether they were predominantly African-American, predominantly European-American or of mixed ethnicity. The two factors were dichotomized at their

mean to create strata. Twenty census tracts were randomly selected for the study representing each strata.

An important methodological problem in neighborhood effects research is assuring that the respondents within each neighborhood are actually experiencing the same set of neighborhood conditions and influences (Coulton, Korbin, Chan & Su, 1997; Elliott and Huizinga, 1990; Sampson & Morenoff, 1997). If residents that the research treats as living within the same neighborhood are really responding to several different neighborhoods as referents, then the neighborhood characteristics would be measured with considerable error. We were concerned that many census tracts were too large and diverse to serve as proxies for neighborhoods, therefore, a block group was randomly selected from each census tract as the neighborhood unit. A several square block area is often considered a reasonable approximation for a neighborhood where families and children are concerned, although research is beginning to suggest that neighbors may not agree on neighborhood boundaries, even within small areas (Coulton, Korbin, Chan, & Su, 1997; Elliot & Huizinga, 1990).

The study design called for locating 20 respondents who were the parents or guardians of children under 18 years old within each block group. Our previous research as well as findings by other neighborhood researchers suggested that 20 respondents per neighborhood would produce neighborhood measures with adequate reliability (Coulton, Korbin & Su, 1996; Sampson, Raudenbush & Earls, 1997). For the purposes of drawing the sample, all addresses in each block group were listed by a survey team. Streets within each block group were then randomly ordered and an address randomly chosen on each street. Interviewers began at the randomly selected address and contacted every third

household which was the interval that was determined to be needed to reach the requisite 20 households with children. Interviewers made three call-backs at different times of the day and different days of the week before excluding a household. Households were eligible for the study if they had at least one child under 18 and at least one parent or guardian living in the home. The parent or guardian served as the respondent.

Interviewers approached 2448 occupied housing units and, after up to 3 call backs, were able to speak with an adult in 2098 households (85.7%). Of the 2098 households that were contacted, 1399 (66.7%) did not have children under 18 years of age residing in the household, 243 (11.7%) refused to be screened, and 56 (2.7%) did not speak English. Four hundred households met the criteria for inclusion in the study and completed all portions of the interview. The selection criteria resulted in a sample that was largely female (81.8 percent) with a mean age of 33.9. While the total sample was almost equally divided between African American and European American respondents, there was high ethnic homogeneity within block groups. This reflects Cleveland's extremely high level of racial segregation (Farley & Frey, 1994; Massey & Denton, 1993).

After obtaining informed consent, the interview took place in the respondents home and took approximately one hour. The length of the interview and the fact that many residents of low-income neighborhoods did not have working telephones or had unlisted numbers were the reasons for using this in-person format. The questions about the neighborhood were read out loud to the respondent and the interviewer recorded the answers. However, the questionnaire items for the child maltreatment measure and other questions of a personal nature were in a self-administered format. In order to assure privacy, the respondent completed this form and placed it in a confidential, sealed

envelope that was not opened by the interviewer. Respondents were compensated with a 15-dollar stipend for completing the interview and self-administered questionnaire.

Neighborhood Measures

The study involved making two types of measures on neighborhoods. Structural measures were made using census data while neighborhood process was measured using aggregations of survey responses within neighborhoods.

The structural characteristics of the neighborhoods chosen for this study were those identified in the authors' previous research as correlated with aggregate rates of child maltreatment in neighborhoods (Coulton et al., 1995). Factor analysis in that study suggested that numerous measures of the economic and demographic characteristics of neighborhoods formed three factors relevant to maltreatment. The factors were labeled impoverishment, child care burden and instability. The census measures that form the factors appear in the Appendix. Factor scores were calculated for each neighborhood on all three factors.

The process measures that were included in this study, were the degree to which neighborhoods contained resources and perceptions of social control. These concepts were chosen based on the authors previous ethnographic studies that compared neighborhoods with high and low rates of official child maltreatment reports. Observations and open-ended interviews in these neighborhoods revealed a set of conditions that were thought by informants to be supportive of children and families (Korbin & Coulton, 1997). In high maltreatment rate neighborhoods as compared to low maltreatment rate neighborhoods informants painted a picture of unpredictability, fear, distrust, deterioration and a general lack of services and supports. They provided descriptions of how these

conditions made it difficult to raise children and for parents and neighbors to nurture and protect them. Subsequently, survey items were developed to reflect these impressions and administered to samples in high and low maltreatment areas (Coulton, Korbin & Su, 1996). The survey items were found to form several reliable scales at both the individual and aggregate level and to discriminate between high and low maltreatment neighborhoods.

For this study we used four of the previously tested scales. Two of the scales, neighborhood quality and neighborhood facilities were chosen as indicators of community resources. Two other scales were included as measures of social control. These were labeled disorder and deterioration and lack of control of children. Scale reliability was calculated for both the individual and aggregate levels (Bryk & Raudenbush, 1992). Neighborhood quality was measured by an eleven item scale reflecting general neighborhood satisfaction (individual level α=.74 ; aggregate level α= .52). Facilities were measured by a facility availability scale which covered 13 local services or conveniences (individual level α= .68; aggregate level reliability .87). A 14 item scale reflected the level of perceived disorder in the neighborhood. (individual level α= .95; aggregate level reliability .85). Lack of control of children was measured by a seven item scale reflecting the perception that retaliation would occur if adults in the neighborhood intervened with children (individual level α= ..90; aggregate level reliability .57).

The aggregate level reliability for the neighborhoods is based on the results of a hierarchical linear model in which :

Level 1 or individual model is:

$$Y_{ij} = \beta_{0j} + \gamma_{ij}$$

Level 2 or the neighborhood model is:

$$\beta_{0j} = r_{00} + u_{0j}$$

Y_{ij} is a neighborhood scale score for respondent i in neighborhood j. We assume $\gamma_{ij} \sim N(0,\sigma^2)$ for i=1, …, n_j respondents in neighborhood j, and j=1, …, 20 neighborhoods. σ^2 is the individual-level variance. Also, we assume $u_{0j} \sim N(0,\pi_{00})$ and π_{00} is the neighborhood-level variance. From this model, the aggregate level reliability is:

$$\lambda = \text{Aggregate level reliability} = \sum_{j=1}^{20} \{\pi_{00} / [\pi_{00} + (\sigma^2 / n_j)]\} / 20$$

Maltreatment Measures

The major outcome of interest was child maltreatment. It was measured in two ways: rates of official child maltreatment reports, and a self-report measure reflecting child abuse potential. The use of multiple indicators or measures of child maltreatment is desirable in this type of research because both have sources of bias (Perkins & Taylor, 1996; Sampson, et al., 1997). An individual level measure is necessary if neighborhood effects are to be examined after controlling for individual risk factors.

Self-reports are an obvious alternative to reported rates as a way of avoiding some of the reporting biases discussed in the background section of this paper. However, in the case of incriminating material such as child abuse and neglect, there are considerable difficulties and ethical constraints in gathering self-report information within the context of neighborhood research (Melton & Limber, 1989; National Research Council, 1993). Self-reports on violent behavior towards children (and other family members) have been gathered using the Conflict Tactics Scales (Straus, 1979; Straus & Gelles, 1990) through

in-person interviews (Straus, Gelles, & Steinmetz, 1980) and anonymous telephone surveys (Straus & Gelles, 1986, 1990). However, because of child maltreatment reporting requirements in all states, ethical considerations require that respondents be warned that they are at risk of being reported if they confirm violence towards their children. In our research, conducted door-to-door, we believed that this would be a substantial disincentive to participation in the study or lead to inaccurate responses to the questions.

We therefore elected to use a measure of child maltreatment propensity or potential instead of a direct measure of abuse or neglect. This not only minimized the ethical issues outlined above, but also fit our ecologically-based research design in that we were interested in the transactions of factors at the individual and neighborhood levels. The Child Abuse Potential Inventory (Milner, 1986, 1994) is a widely used instrument which, although validated against reported abuse, asks no direct questions about abusive or neglectful acts. The CAP was developed to distinguish between physically abusive and non-abusive parents in clinical and child protection settings. It was not developed for use in a broader non-clinical population such as the neighborhood context in which we used it, although it has been utilized in general population studies in Spain and with undergraduate students (de Paul, Arruabarrena, & Milner, 1991; Milner, 1990). Additionally, the CAP was developed for use with physical abuse and we have used it as a proxy for all maltreatment which includes physical abuse, sexual abuse, emotional abuse, and neglect. Further, child abuse prediction instruments must be interpreted cautiously. Predictive instruments, including those measuring child abuse potential, have been criticized as having too great a possibility of misclassification (e.g. Melton & Limber, 1989). Prediction

of violence has proven quite difficult, with the best predictor of violent behavior being prior violent behavior (Chaiken, Chaiken, & Rhodes, 1993).

Despite these limitations, the CAP is among the most widely-used instruments to classify abusive parents. In this analysis, we use two scales from the CAP: the abuse scale and the experimental neglect scale. The Child Abuse Potential Inventory (CAP) is a 160-item self-report instrument that is answered in an agree/disagree, forced choice format. The 77-item physical abuse scale has high reliability, construct validity, and predictive validity (see Milner, 1994 for an extensive review). The 63-item experimental neglect scale has been subjected to fewer studies, reliability, and validity (Milner, 1986) and is suggested for use in research but not for identification of neglectful parents. We chose to use this scale because the majority of child protection reports involve an allegation of neglect (National Center on Child Abuse and Neglect, 1996; National Research Council, 1993) and because child neglect has been linked with neighborhood structural factors (Drake & Pandey, 1996).

Official child maltreatment rates also were calculated for each neighborhood using all "substantiated" and "indicated" reports in 1991, 1992 and 1993 to the Department of Family and Children's Services. Substantiated reports are those that the child protection agency determines are valid reports based on state law or policy. Indicated reports are those that have a high level of suspicion that child maltreatment has occurred, even if there is not sufficient information to validate the case. In the calculation of rates, cases in which the same child had multiple reports of maltreatment were counted only once because we were interested in the proportion of children who experienced maltreatment rather than the number of reports that were made. Child maltreatment rates were calculated by

counting the total number of children living in each census tract who experienced one or more substantiated or indicated cases of maltreatment in each year and dividing by the population of children in the tract ages 0-17 according to the 1990 census. The mean of the three years was calculated for each neighborhood since multi-year average are considered more stable for small area indicators. The well-known problems with using official reports as a measure of child maltreatment were discussed earlier.

Individual Demographic and Risk Factors

The main purpose of this study was to examine the effects of neighborhood structure and process on maltreatment. However, it is important to do this while also taking into account individual level characteristics, especially those that might be confounded with neighborhood conditions. A set of individual level risk factors shown in previous research to correlate with child maltreatment were, therefore, measured in the survey. These included child abuse in the family of origin, personal social support and demographic characteristics such as income, education, and marital status. (National Research Council, 1993). Tenure in the neighborhood was also included because it was expected to affect neighborhood perceptions (Sampson, et al., 1997). Race was not included as an individual variable because of within neighborhood homogeneity on this variable. It is difficult to separate the effects of race-differentiated environments from an individual's race (Brewster, 1994) and, in this study race was a variable that loaded on the neighborhood impoverishment factor.

Child abuse in the family of origin was measured using a modification of the Conflict Tactics Scales (CTS) (Straus, 1979; Straus & Gelles, 1990). The CTS is among the most widely used instruments in family violence and child maltreatment research with

acceptable reliability and strong construct validity. The severe violence scale was used in our analysis because it has the closest relationship to child maltreatment. In addition, the CTS has shown findings consistent with research and theory on the intergenerational transmission of violence in the family (Carroll, 1977; Straus, Gelles & Steinmetz, 1980).

Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS), a twelve item self-report scale (Zimet, Dahlem, Zimet & Farley, 1988). The MSPSS has three subscales measuring support from family, friends, and significant others. In this study, we used the scale as a whole. The internal consistency reliability (Chronbach's alpha) for the total scale is .88 with a test-retest reliability of .85.

Analysis

The primary approach to analyzing the data was hierarchical linear modeling (HLM) (Bryk & Raudenbush, 1992). HLM was chosen because it is appropriate for the nested data structure of this study. HLM provides estimates that are pertinent to the purpose of this research. Specifically, it provides estimates of variance components both between and within neighborhoods. Further, it allows explicit modeling of the variation between and within neighborhoods using factors at the individual and neighborhood levels. It also allows the effects of individual level factors to vary between neighborhoods and can estimate the effects of neighborhoods net of individual factors. The sample size of 20 cases per neighborhood is considered adequate for modeling reliable neighborhood level measures (Raudenbush, 1988) but the number of neighborhoods (i.e., 20) in this study appears to be at the lower bound for this technique.

In this study we modeled the factors hypothesized to explain differences among individuals at level 1. We allowed the slopes of individual level predictors to be random

across neighborhoods. Individual scores were centered around each neighborhood's mean. The statistical model for level 1 is:

$$Y_{ij} = \beta_{0j} + \sum_{q=1}^{Q} \beta_{qj}(X_{qij} - X_{q.j}) + r_{ij} \qquad r_{ij} \sim N(0, \sigma^2)$$

where Y_{ij} is the outcome variable for respondent i in neighborhood j. β_{0j} is the mean of the outcome score for neighborhood j. X represents the individual level predictors numbered from 1 to Q. Thus, X_{qij} is the qth individual predictor, for respondent i in neighborhood j; $X_{q.j}$ is the mean of the q^{th} individual predictor for the respondents in neighborhood j; and β_{qj} is the slope of the q^{th} individual predictors for site j. The r_{ij} are errors assumed to be independent and normally distributed with a mean of 0 and variance, σ^2.

The explanatory factors for between neighborhood variation are modeled at level 2. In our case, β_{0j}, the intercepts or means for neighborhood j, are treated as dependent variables and neighborhood characteristics are the level-2 predictors. If there is no interaction effects between neighborhood and individual predictors, the slopes for individual predictors are modeled as a function of an average value, γ_{q0}, plus a random effect associated with each level-2 unit (u_{qj}). The neighborhood factors were centered around a grand mean.

The models for level 2 are:

$$\beta_{0j} = \gamma_{00} + \sum_{k=1}^{K} \gamma_{0k}(W_{kj} - W_{k.}) + u_{0j} \qquad u_{0j} \sim N(0, \tau_{00})$$

$$\beta_{qj} = \gamma_{q0} + u_{qj} \qquad u_{qj} \sim N(0, \tau_{qq})$$

where W is the neighborhood factors numbered from 1 to K. The W_k. is the grand mean of the k^{th} neighborhood factor and γ_{0k} is the level-2 coefficient of the k^{th} factors. The u_{0j} is the unique effect of neighborhood j on the outcome holding W_{kj} constant. It is independently and normally distributed with mean 0 and variance τ_{00}. The level 1 and level 2 models are combined and estimated simultaneously using restricted maximum likelihood by the HLM software.

This study hypothesized that the effects of neighborhood on maltreatment could occur as a result of both structural factors and neighborhood resources and supports. However, it was also anticipated that structural factors might affect the processes within the neighborhoods' measures of the resources and supports. Therefore, we also tested a hierarchical linear model in which resources and supports were the dependent variables and structural factors were the level 2 predictors.

Finally, as stated earlier, this study has two measures of maltreatment. The CAP scale is an individual level measure and can be modeled in HLM using individual and neighborhood predictors. However, the child maltreatment rate is an aggregate measure for which there is no individual level model. Nevertheless, it is of interest to determine the degree to which the neighborhood process measures are related to this, more widely used, indicator. The limitation on the degrees of freedom associated with the aggregate level (N=20) force us to limit this analysis to a simple, descriptive analyses which is merely suggestive.

RESULTS

In this section we address several interrelated questions regarding the effect of neighborhood structural and process factors on child maltreatment. First, we examine the distribution of variables at both the individual and neighborhood levels and the degree of within and between neighborhood variation on key variables. Second, we address the question of whether the structural factors previously linked to aggregate child maltreatment rates, are related to resident's perceptions of community resources and controls. Finally, we examine whether the structural characteristics of neighborhoods and perceptions of community resources and controls have an affect on child maltreatment potential, net of individual risk factors.

Description of Respondents and Neighborhoods

The means and standard deviations for study variables are presented in Table 1. The table also displays the intraclass correlation (ICC) for each variable which is computed as the ratio of the variance between neighborhoods to the total variance (i.e. variance between and within neighborhoods). If the ICC is low the variable displays little systematic difference across neighborhoods compared to the amount of difference within neighborhoods. ICCs are not presented for variables derived from the census or for maltreatment rates because these have only one score per neighborhood.

The ICCs in table 1 are clearly quite low for the child maltreatment measures and individual risk factors. In fact, for the total abuse scale the ICC is only .02 and the ICC is .05 for the experimental neglect scale. This means that the variation in child abuse potential within neighborhoods is much greater than between neighborhoods. This is due to within neighborhood heterogeneity but the ICC can also be constrained by a restricted

range of neighborhoods. Since there are no other studies that report within or across neighborhood variation in CAP scores, we cannot assess how representative our sample is in this regard. Although the between neighborhood variance is modest suggesting that there is little to explain with neighborhood factors, it has been traditional to test multilevel models with ICCs as low as .05 or even lower (Cook, et al., 1997).

The small differences across neighborhoods on the child abuse and neglect potential measures are in stark contrast to the neighborhood differences in rates of reported child maltreatment. Table 2 lists the 20 neighborhoods in the study from lowest to highest on maltreatment rates along with the mean scores on the abuse and neglect potential scales. It can be seen that these two indicators do not have a close correspondence at the neighborhood level. The correlation coefficient for the 20 neighborhoods is weak and insignificant (i.e., .36 for total abuse and .38 for experimental neglect).

The neighborhood resources and supports measures show relatively larger ICCs than the CAP scales. This is indicative of the fact that there is greater homogeneity on how these are viewed within neighborhoods and that the neighborhoods are clearly different from one another in this regard. These patterns were expected since the resource and support scales were derived from ethnographic work that deliberately sought to identify how neighborhoods differed as a place for families and children.

The zero order correlation's among study variables are presented in table 3. At the neighborhood level, both process and structural measures are correlated with each other and child maltreatment rates. The individual risk factors for child maltreatment are

correlated with the total abuse score and the experimental neglect score in the expected direction.

Neighborhood Structure and Process

This section addresses the question of whether there is neighborhood variation in residents' perceptions of resources and controls and whether these differences are associated with the neighborhoods' structural characteristics. In the analysis we control, at the individual level, for those personal characteristics that could affect neighborhood perceptions. These include social support, income, and violence in the family of origin, marital status, education and tenure in the neighborhood of the respondent. The level two, or neighborhood level factors, include the census based measures of neighborhood structure, the impoverishment, child care burden and instability factors.

Table 4 presents the coefficients from the HLM for both the individual and neighborhood level predictors of the four measures of perceived resources and control: Neighborhood quality, facilities, disorder and lack of control over children. It can be seen that, after adjusting for individual characteristics, these resources and controls as perceived by residents do differ significantly across neighborhoods. All three of the structural factors are significant predictors at the neighborhood level of at least one of the measures of resources and controls. Perceived quality is lower in neighborhoods with high impoverishment and child care burden. Differences in facility availability across neighborhoods are only explained by instability. Disorder at the neighborhood level is higher when impoverishment, child care burden and instability are high. Finally, lack of control over children in the neighborhood is explained by all three factors. The neighborhood structural factors explain the largest amount of between neighborhood

variation for perceived quality and disorder. Facility availability, although showing considerable variation across neighborhoods (ICC=.26), is the least well explained by the structural factors.

Neighborhood Effects on Maltreatment

The child abuse and neglect potential scales were also subjected to a multilevel analysis using HLM. The level one variables were the individual risk factors of violence in the family of origin, social support, family income, education, marital status and tenure in the neighborhood. Two models are tested for level two, the neighborhood level. The first model includes perceived neighborhood resources and controls which were hypothesized to be the process factors that would relate to child maltreatment. The second model uses the structural factors of impoverishment, child care burden and instability to explain between neighborhood variation.

The results of the multilevel models are presented in Table 5. For the selected CAP scales, the individual risk factors of social support, violence in the family of origin, education and family income have significant effects in the expected direction. However, the explanatory power of the neighborhood measures is fairly weak. Only the neighborhood structural factors are significant. The neighborhood process variables are not significant predictors in the level two model. Although the structural variables explain a large proportion of the between neighborhood variation, the between neighborhood variation is a rather small proportion of the total variation in maltreatment potential. Thus, with respect to child abuse potential the lack of systematic variation across neighborhoods makes it difficult to uncover the neighborhood factors that might be responsible for such differences.

The hierarchical linear model presented in Table 5 also includes selected interaction effects. This is consistent with the hypothesis that neighborhood conditions could exacerbate or mitigate individual risk factors for child maltreatment. For example, violence in the family of origin may be a stronger predictor of maltreatment in a poor or more affluent neighborhood. Such non-additive effects were tested by including cross level interaction effects in the model. To test this interaction hypotheses, we expanded the level 2 model to:

$$\beta_{qj} = \gamma_{q0} + \gamma_{q1} (W_{1j} - W_1) + u_{qj} \qquad u_{qj} \sim N(0, \tau_{qq})$$

where γ_{q0} are the intercepts and γ_{q1} are partial regression coefficients of the neighborhood factor w_1 for the slope of individual level predictor q, representing the interaction effects.

We tested cross-level interactions for impoverishment and violence in the family of origin and social support since the within neighborhood slopes on these variables showed significant variation. Two of these interactions were significant at the .10 level. First, there was an interaction between neighborhood impoverishment and violence in the family of origin. Specifically, the slope for violence in the family of origin and maltreatment was nearly flat in the poorest neighborhoods while it was much steeper in more middle class neighborhoods. In other words, the known risk factor of family of origin violence is a weaker predictor of maltreatment potential in the most impoverished areas.

The second interaction effect that was significant was between the neighborhood child care burden factor and the individual protective factor of education. Educational attainment was inversely related to child maltreatment in neighborhoods with low child

care burden. However, in neighborhoods high on the child care burden factor, there was no protective effect of parent's education on maltreatment potential.

In a final analysis we returned to the official child maltreatment rates since this is the measure of child maltreatment that has been consistently related to neighborhood structure. In this analysis we examined the degree to which these rates were related to the measures of resources and supports in the study neighborhoods. Since child maltreatment rates are calculated as a single score for each neighborhood, multilevel analysis was not possible. Further, the small number of neighborhoods precluded a multivariate analysis. However, the bivariate correlations between maltreatment rates and the four process measures were in the expected direction and ranged from -.37 for neighborhood quality to .58 for neighborhood disorder (see table 3). The relationships between structural factors and maltreatment rates are not reported for this small sample because they have been studied extensively with large samples of neighborhoods and found to be significant (Coulton et al, 1995).

DISCUSSION

This study sought to deepen our understanding of the often observed ecological correlations between reported child maltreatment rates and structural characteristics of neighborhoods. The study sought to advance this research in several ways. First, measures of perceived neighborhood resources and controls were included as possible mechanisms through which neighborhood structural conditions might affect child maltreatment. Second, an individual measure of child abuse potential was used as an alternative to aggregate rates of reported child maltreatment. The child abuse potential measure was

chosen as a way of minimizing the influence of response and reporting biases. Finally, individual risk factors were controlled in a multilevel model as a way of minimizing the possibility that the geographic concentration of at risk families in poor and unstable neighborhoods would be misinterpreted as neighborhood effects.

The first set of analyses examined the residents' perceptions of resources and controls in their neighborhoods. As anticipated, these perceptions differed significantly across neighborhoods after controlling for demographic and background characteristics of respondents. Structural factors were significant predictors of these neighborhood differences in perceived resources and controls. Neighborhoods with high levels of impoverishment, instability and child care burden were perceived as having lower overall quality, greater disorder and a reluctance of adults to control children. Neighborhood differences in facilities and services were only partially explained by these neighborhood structural measures. These findings are consistent with the growing body of literature that suggests raising children in impoverished, unstable and isolated neighborhoods presents many challenges for parents. They have fewer resources and parenting is made more difficult through the disorder and lack of controls in the surrounding environment (Sampson, 1992; Elliott, Wilson, Huizinga, Sampson, Elliott & Rankin, 1996; Furstenberg, 1993). Even though successful parents find innovative strategies to overcome these difficulties (Jarrett, 1995), structural inequalities result in inequities in community supports and resources for parenting.

The second set of analyses was intended to determine whether neighborhood structural factors and perceived resources and controls were related to child maltreatment. It was important to examine these neighborhood effects net of individual risk factors

which might occur more frequently in some neighborhoods than others. Thus, the measure of child maltreatment used was one of child maltreatment potential rather than actual abusive or neglectful acts, allowing these data to be gathered in individual interviews along with measures of personal risk factors. The neighborhood differences on this child maltreatment potential measure were unexpectedly small. The structural factors, but not the neighborhood process measures, were significant in explaining these modest neighborhood differences.

There was some tentative evidence that neighborhood structural factors might modify the influence of individual risk factors, though. This study found that adverse neighborhood conditions seemed to weaken the effects of known risk and protective factors such as education and violence in the family of origin. While the certainty of these findings was limited due to the small numbers of neighborhoods in this study, the pattern is consistent with a much larger, multi-level study of neighborhood effects on low birth weight births (O'Campo, Xue, Wang & Caughy, 1997). Like our study, O'Campo and colleagues' study of Baltimore found that the additive effects of neighborhood conditions on low-birth weight were few but there were several significant interaction effects between neighborhood economic conditions and individual risk factors. Living in a poor, Baltimore neighborhood reduced the protective effect of some individual factors, such as receiving prenatal care. However, poor neighborhood residence increased the negative influence of a few risk factors, such as low education. Taken together, the Cleveland and Baltimore studies suggest that neighborhood influences may operate through complex patterns of non-additive effects rather than the additive effects tested in most studies.

This is the first study of which we are aware that attempts to link child maltreatment with neighborhood characteristics by using individual survey measures and a multilevel model. The fact that its findings do not show the marked neighborhood differences found in studies using aggregate rates of reported child maltreatment and ecological correlations calls for consideration of several methodological and theoretical issues. The current study differs from the previous aggregate studies in several ways: It used a measure of maltreatment potential rather than officially reported rates of maltreatment; it modeled the relationships among variables at the individual and neighborhood level rather than the just the aggregate level; and, because of the need to have sufficient respondents in each neighborhood, it included fewer neighborhoods than aggregate studies which rely on administrative and census data. Each of these differences may bear some responsibility for the discrepant findings.

First, rates based on official reports may differ from a self-report measure because of the multiple influences that turn abuse and neglect into a founded case of maltreatment. Studies have shown that less than half of reportable child maltreatment events are actually reported and that there may be racial and economic differences in who reports and the types of maltreatment that are reported (Ards, Chung, & Myers, 1998; Ards & Harrell, 1993). Further, child protection agencies may confirm reports at a higher rate based on reporter or perpetrator characteristics as discussed in the background section of this paper. In fact, substantiation rates for neglect have been shown to be higher in poor neighborhoods (Drake & Pandey, 1996). If child maltreatment has a higher probability of being reported or substantiated in poor, unstable neighborhoods with a concentration of

single mothers and children, this would bias the ecological correlations upward in most of the existing studies.

A second issue is the nature of the self-report measure used in this study. It was designed originally to be used as a measure of maltreatment potential and shown to discriminate well between groups of abusers or neglecters and non-abusers or neglecters. It was chosen for this neighborhood study because ethical and response bias considerations prevented us from asking direct questions about abusive or neglectful acts in this in person interview. A cut-off point on this scale has been established for identifying persons with the highest likelihood of abuse or neglect, but the use of the cut-off score did not produce large neighborhood differences either. The Child Abuse Potential scale, while well validated and widely used, is essentially a psychological profile correlated to abusive or neglectful acts rather than the acts themselves. Since there are only small between neighborhood differences in these profiles even though there are wide differences in reported rates of maltreatment, it is possible that neighborhood conditions, while not affecting potential, may affect whether potential turns into real, reportable incidents. Unfortunately, this could not be studied without violating the confidentiality of abuse and neglect reports. What can also not be ruled out is that the child abuse potential measure, as used in this neighborhood setting, was subject to social desirability bias which would have the effect of lowering the scores. If this social desirability bias was particularly strong in poor and unstable neighborhoods, this would bias neighborhood effects downward.

Although the sample of 20 cases per neighborhood was considered adequate for making reliable measures of neighborhood process, it might not be adequate to capture the range of abuse potential scores. If high scores are relatively rare, as they would be in

neighborhoods where maltreatment rates are almost always below 7 percent, sampling error alone may have resulted in low estimates of neighborhood effects. However, 18 per cent of the sample had scores that exceeded the cut-off point recommended for the Child Abuse Potential scale and shown in validation studies to be highly indicative of abuse (Milner, 1986). The small number of neighborhoods all located in the city may have limited the range of scores on the low end, but the sample did include many cases with very low CAP scores.

A third consideration is the difference between aggregate studies that demonstrate ecological correlations and multilevel studies that explicitly attempt to disentangle the personal influences from ones at a higher level of social organization, in this case the neighborhood. Ecological correlations are ambiguous as to why social and economic characteristics of neighborhoods are correlated with child maltreatment. Although the underlying theory is often one of social control, social cohesion, social resources or social supports, these processes are not measured. Further, these ecological correlations are vulnerable to the alternative explanation of selection; that is, persons with numerous risk factors for maltreatment select, or are forced to choose, poor and unstable neighborhoods. For the purposes of knowing where to offer services or the conditions under which services need to operate, it may not make much difference whether it is neighborhood effects or the selection process that produces neighborhood concentration of child maltreatment. However, if strengthening communities is to be an avenue to prevent maltreatment, it is necessary to understand the role of selection as well as the community processes that are powerful influences. Unfortunately, this study does not have a straight forward answer to this question. It does suggest that social resources and social control

are processes that are affected by structural factors. These are the same structural factors that have been linked to aggregate rates of reported maltreatment. However, because of the large within neighborhood variance in individual measures of maltreatment potential relative to the between neighborhood differences, there was little ability to sort out structures and processes responsible for neighborhood influences net of individual risk factors. Nevertheless, the fact that violence in the family of origin and social support did not differ significantly among neighborhoods suggests that there is little neighborhood selection on these important risk factors.

Attempts to test multi-level models of neighborhood effects on children and families are relatively rare and known to present formidable methodological challenges. One concern that is pertinent to this study has been well described by Cook et al. (1997) in their studies of large numbers of Philadelphia and Prince George's County neighborhoods. They found that measures of parenting, family management and psychological well being showed very small variance between neighborhoods as compared to within neighborhoods yielding intraclass correlations that were often quite low. This is despite the fact that qualitative descriptions of some of these same neighborhoods would have suggested important neighborhood differences on these parenting concepts (Furstenberg, 1993). The child abuse potential measure used in this study has similar properties to the parenting and psychological measures examined by Cook and raises the question of whether it is feasible to isolate the effects of neighborhood processes on phenomenon that are so heterogeneous within neighborhoods. Although the small number of neighborhoods in this study limits statistical power and raises the possibility of restriction of range, the patterns were quite similar to the large samples examined by Cook, et al. (1997).

Although this study set out to determine whether neighborhood resources and controls could account for the aggregate relationships between structural factors and child maltreatment while controlling for individual risk factors, it has instead raised a number of possibilities. If the Child Abuse Potential scale is believed to measure a predilection to act rather than a prediction of acts, it is possible that neighborhoods may affect not the predilection itself but the chances that potential abuse and neglect will turn into action. While child abuse potential differs by only a modest amount across neighborhoods, the fact that actual rates differ markedly could argue that resources and controls in neighborhoods may prevent actual child maltreatment among populations that are similarly predisposed. Resource poor and unsupportive environments may exacerbate potential that exists while neighborhoods with more positive influences may limit the expression of this potential.

An alternative interpretation of these findings could be a story about neighborhood processes that affect the recognition and reporting of child maltreatment, but not its real occurrence. If the CAP scales are thought to capture hidden and unreported child maltreatment and this differs little across neighborhoods, then most of the difference in reported maltreatment rates would have to do with the factors affecting how reports get made and substantiated. The link between neighborhood processes and reported rates could be due to higher chances of discovery in communities that are viewed internally and externally as lacking resources and controls. There has long been debate in the child maltreatment field as to whether poverty was related to increased reporting because of increased scrutiny of poor and minority families or because of increased stress on families that was more likely to spill over into abuse or neglect. Our research cannot directly test

whether increased scrutiny coupled with reporting bias against residents of poor, disadvantaged, and primarily minority communities distorts child maltreatment report rates.

Our research does suggest, however, that if individual potential for child maltreatment is more evenly distributed across neighborhoods than reported maltreatment, then neighborhood and community play an important, if as yet unspecified, role in child maltreatment. This is consistent with other research that has found poverty to be a major stressor and contributor to child maltreatment (e.g. Pelton, 1981). The ambiguity of these findings suggests the need for research on how the discovery, reporting and substantiation of child maltreatment differs based upon neighborhood conditions. They also suggest that the strong and persistent ecological correlations between structural characteristics and rates of reported maltreatment cannot be taken at face value as evidence of neighborhood effects but require continued attempts to test multilevel models that also examine cross-level interactions.

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Table 1: Means (Standard Deviations) and Intraclass Correlations for Study Variables

	Individual	Neighborhood	Intraclass
Individual maltreatment			
Total child abuse scale	110.42 (80.00)	110.42 (19.46)	0.015
Experimental neglect scale	20.73 (8.48)	20.73 (2.50)	0.047
Individual Risk factors			
Violence in family of origin	0.22 (0.42)	0.22 (0.11)	0.010
Social support	4.11 (0.88)	4.11 (0.18)	0.000
Family income	6.39 (3.61)	6.39 (1.31)	0.067
High school graduate (1=at least HS graduate)	0.73 (0.45)	0.73 (0.15)	0.061
Married (1=married)	0.44 (0.50)	0.44 (0.18)	0.076
Tenure in neighborhood (years in neighborhood)	10.71 (10.98)	10.71 (2.93)	0.010
Neighborhood resources and supports			
Neighborhood quality	6.23 (2.36)	6.23 (0.87)	0.055
Neighborhood facilities	8.32 (1.60)	8.32 (0.88)	0.259
Neighborhood disorder	4.98 (2.32)	4.98 (1.26)	0.232
Neighborhood lack control over children	6.13 (2.50)	6.12 (0.85)	0.066
Neighborhood structure (census measures)			
Impoverishment factor score	N/A	-0.09 (0.77)	N/A
Child care burden factor score	N/A	-0.14 (1.12)	N/A
Instability factor score	N/A	0.25 (1.16)	N/A
Reported maltreatment			
Child maltreatment rate	N/A	37.69 (16.84)	N/A

N/A: Not applicable

Table 2. Child Maltreatment (CM) Rates and Means & Standard Deviations Of Child Abuse Potential Scale Scores for Each Neighborhood

Neighborhood	CM rate	Total abuse score		Experimental neglect score	
		Mean	s.d.	Mean	s.d.
A	11.63	84.80	60.21	17.41	6.29
B	15.04	93.95	73.81	16.99	8.01
C	18.10	98.40	66.51	18.66	5.92
D	18.42	119.25	66.67	21.88	7.93
E	25.93	118.75	90.31	21.86	9.45
F	26.18	120.45	77.27	22.00	8.17
G	27.88	98.50	70.05	20.73	7.85
H	29.85	122.45	80.31	22.71	8.28
I	36.13	98.65	66.76	19.76	7.90
J	36.89	120.90	97.04	22.57	9.51
K	39.09	113.30	93.18	20.44	8.05
L	39.22	92.40	69.06	18.00	7.32
M	41.41	117.45	95.95	22.09	10.18
N	43.33	103.30	83.56	19.63	10.26
O	43.59	127.50	91.88	22.12	8.57
P	46.78	60.50	56.51	14.95	6.78
Q	54.64	128.50	65.83	22.15	7.61
R	60.53	150.90	108.12	25.27	10.01
S	68.47	120.50	74.20	22.70	6.72
T	70.62	117.95	82.16	22.76	9.63

Table 3: Neighborhood-Level and Individual-Level Zero-Order Correlation Coefficients for Study Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NEIGHBORHOOD LEVEL																				
Reported maltreatment																				
1. Child maltreatment rate	—																			
Neighborhood structure (census measures)																				
2. Impoverishment factor score		—																		
3. Child care burden factor score		-.51[a]	—																	
4. Instability factor score		-.10	-.41	—																
Neighborhood resources and supports																				
5. Neighborhood quality	-.37	-.53[a]	-.23	.28	—															
6. Neighborhood facilities	-.10	.05	.02	-.44	.03	—														
7. Neighborhood disorder	.58[b]	.52[a]	.20	.02	-.83[c]	-.21	—													
8. Neighborhood lack control over children	.57[b]	.34	-.02	.38	-.55[a]	-.41	.76[c]	—												
INDIVIDUAL LEVEL																				
Neighborhood resources and supports																				
9. Neighborhood quality									—											
10. Neighborhood facilities									.13[b]	—										
11. Neighborhood disorder									-.55[c]	-.12[a]	—									
12. Neighborhood lack control over children									-.42[c]	-.21[c]	.57[c]	—								
Individual maltreatment and risk factors																				
13. Total child abuse scale									-.18[c]	-.04	.23[c]	.19[c]	—							
14. Experimental neglect scale									-.15[b]	.01	.20[c]	.17[c]	.88[c]	—						
15. Violence in family of origin									-.14[b]	.02	.20[c]	.14[b]	.30[c]	.25[c]	—					
16. Social support									.13[a]	.05	-.18[c]	-.09	-.43[c]	-.32[c]	-.25[c]	—				
17. Family income									.08	.02	-.15[b]	-.06	-.31[c]	-.29[c]	-.03	.15[b]	—			
18. High school graduate									.17[c]	.08	-.17[c]	-.11[a]	-.29[c]	-.30[c]	-.10	.11[a]	.24[c]	—		
19. Married (1=married)									-.02	-.11[a]	-.01	.06	-.23[c]	-.21[c]	.01	.20[c]	.45[c]	.10	—	
20. Tenure in neighborhood									-.17[c]	-.06	.12[a]	.09	-.01	.01	-.07	.04	.21[c]	.01	.07	—

[a] $p<.05$ [b] $p<.01$ [c] $p<.001$

Table 4: Hierarchical Linear Modeling Analysis of Neighborhood Resources and Supports

Variable	Quality		Facilities		Disorder		Lack control of children	
	Coefficient	St. Error	Coefficient	St. Error	Coefficient	St. Error	Coefficient	St. Error
Intercept	6.15***	0.11	8.32***	0.19	4.98***	0.15	6.13***	0.15
Level I: Individual predictors								
Social support	0.22	0.13	0.09	0.11	-0.30*	0.13	-0.12	0.17
Family income	0.01	0.04	0.04	0.03	-0.04	0.04	-0.06	0.05
Violence in family of origin	-0.41	0.30	0.09	0.26	0.64*	0.29	0.49	0.36
Married	-0.48	0.31	-0.30	0.20	0.28	0.25	0.36	0.30
Education (1= at least h. s.)	0.71	0.33	-0.04	0.17	-0.27	0.27	-0.19	0.33
Tenure	-0.04**	0.01	-0.01	0.01	0.03**	0.01	0.02	0.01
Level II. Neighborhood factors								
Impoverishment	-0.93***	0.19	0.09	0.22	1.73***	.25	0.97***	0.25
Child care burden	-0.59 ***	0.14	-0.05	0.16	1.13***	.18	0.65**	0.18
Instability	-0.11	0.11	-0.29*	0.14	0.58**	.15	0.58**	0.15
Variance Components								
Within neighborhoods	3.95		1.60		3.75		5.36	
Between neighborhoods	0.04		0.62		0.26		0.18	
Percent variance explained								
Within neighborhoods	15.05		17.95		10.29		9.70	
Between neighborhoods	87.10		11.43		79.84		61.70	

*p<.05 **p<.01 ***p<.001

Table 5: Hierarchical Linear Modeling Analysis of Child Maltreatment Potential

Variable	Model I: Neighborhood processes				Model II: Neighborhood structure			
	Total abuse score		Experimental neglect		Total abuse score		Experimental neglect score	
	Coefficient	St. Error	Coefficient	St. Error	Coefficient	St. Error	Coefficient	St. Error
Intercept	110.43***	4.29	20.69***	0.51	111.31***	3.42	20.70***	0.42
Level I: Individual predictors								
Social support	-34.60***	6.14	-2.52**	0.66	-35.15***	6.16	-2.50**	0.65
Family income	-3.26*	1.30	-0.30*	0.13	-3.39*	1.30	-0.31*	0.14
Violence in family of origin	31.94*	10.81	2.96*	1.18	33.43**	10.78	3.09*	1.18
married	-18.05†	8.69	-1.64†	0.93	-19.77*	8.81	-1.73†	0.95
Education (1= at least h. s.)	-29.79**	9.78	-3.51**	0.96	-31.40**	9.86	-3.64**	1.01
Tenure	0.60	0.41	0.06	0.04	0.65	0.40	0.06	0.04
Level II. Neighborhood								
Resources and Supports								
Quality	-5.24	9.09	-0.70	1.09				
Facilities	2.47	5.46	0.17	0.66				
Disorder	2.65	7.94	0.99	0.95				
Lack control of children	5.46	8.51	-0.24	1.02				
Structural factors								
Impoverishment					19.10**	5.87	2.99**	0.71
Child care burden					13.37**	4.19	1.87**	0.52
Instability					5.32	3.52	0.47	0.44
Interaction Effects								
Impoverishment and								
Violence in family of origin					-24.85†	13.33	-1.29	1.46
Child care burden and Education					-15.96*	7.22	-0.90	0.76
Variance Components								
Within neighborhoods	3586.25		48.07		3616.78		48.10	
Between neighborhoods	179.09		2.75		40.96		1.08	
Percent variance explained								
Within neighborhoods	42.18		29.67		41.68		29.63	
Between neighborhoods	24.75		39.29		82.79		76.16	

† p<.10 *p<.05 **p<.01 ***p<.001

Appendix: Structural Factors from 1990 Census Data

Variables & Factors	Definition	Factor Loading
Impoverishment		
Family headship	% households with children that are female-headed	.87
Poverty rate	% poor persons, 1990	.85
Unemployment rate	% residents unemployed	.80
Vacant housing	% vacant housing units	.77
Population loss	% 1980-90 population	.78
Percent black	% residents classified as black	.66
Instability		
Movement, 85-90	% who moved between 1985 and 1990	.88
Tenure <10 years	% households in current residence less than 10 yrs.	.91
Recent movement, 89-90	% households that moved in 1 year	.83
Child Care Burden		
Child/adult ratio	no. of children (0-12)/no. of adults (21+)	.83
Male/female ratio	adult male (21-64)/adult female (21-64)	-.73
Elderly population	% population over 65 years old	-.82